

**REMARKS**

Claim 19 has been amended to correct an antecedent error, no new subject matter has been added. Accordingly, claims 6-12, 15, 17-21, 23-27, and 30-35 are currently pending in the case. Further examination and reconsideration of the presently claimed application are respectfully requested.

**Allowed Claims**

Applicant appreciates the Examiner's allowance of claims 6-12, 15, 17, 18, 26, 27, and 30-35 and awaits allowance of the remaining claims.

**Allowable Subject Matter**

Claims 20 and 23-25 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. Although Applicant appreciates the Examiner's recognition of the patentable subject matter, it is believed that claim 19 (from which claims 20 and 23-25 depend) is patentably distinct from the cited art, as set forth in more detail below.

**Section 103 Rejections**

Claims 19 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application No. 2002/0052124 to Raaijmakers et al. (hereinafter referred to as "Raaijmakers") in view of U.S. Patent No. 6,319,775 to Halliyal et al. (hereinafter referred to as "Halliyal") further in view of U.S. Patent 6,511,876 to Buchanan et al. (hereinafter referred to as "Buchanan") and further in view of U.S. Patent Application No. 2002/014500 to Foglietti et al. (hereinafter referred to as "Foglietti"). To establish a *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP 2143.03. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so. *In re Bond*, 910 F. 2d 81, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990). The cited art does not teach or suggest all

limitations of the currently pending claims, some distinctive limitations of which are set forth in more detail below.

**None of the cited art, taken alone or in combination, teaches or suggests growing an oxide film on a semiconductor topography in a first chamber at a first temperature in the presence of an ozonated substance, transferring the semiconductor topography from the first chamber to a second chamber while exposing the semiconductor topography to a substantially similar temperature as the first temperature, and forming a nitride layer upon the oxide film in the second chamber at a second temperature. Claim 19 recites:**

A method for forming an oxide-nitride stack upon a semiconductor topography, comprising: growing an oxide film upon the semiconductor topography in a first chamber at a first temperature, wherein said growing comprises rinsing the semiconductor topography with an ozonated substance; transferring the semiconductor topography from said first chamber to a second chamber, wherein said transferring comprises exposing the semiconductor topography to a substantially similar temperature as said first temperature; and forming a nitride layer upon the oxide film in said second chamber at a second temperature.

As noted on page 2 of the Office Action, Raaijmakers fails to teach transferring a topography to a different chamber between depositions of oxide and nitride layers, much less at the recited temperature configuration. In addition, the Examiner admittedly states that Raaijmakers fails to teach rinsing a topography with an ozonated substance to grow an oxide film. To overcome such a lack of teaching, the Examiner cites the teachings of Halliyal, Buchanan, and Foglietti and deems it would be obvious to one skilled in the art to combine such references with Raaijmakers to teach the limitations of claim 19. Such speculation, however, is traversed as set forth in more detail below.

As noted in a response to a previous Office Action mailed December 17, 2004, Halliyal does not teach or suggest the transfer process specified in claim 19 as purported by the Examiner. In particular, there is no teaching or suggestion within Halliyal of transferring a topography at a temperature similar to a temperature at which an oxide layer was previously deposited. More specifically, there is no mention in Halliyal of a transfer process between the depositions of first silicon oxide layer 28 and silicon nitride layer 30, much less the temperature at which such a transfer process may be conducted. Although Halliyal teaches transferring the topography between the depositions of silicon nitride layer 30 and second silicon oxide layer 32 such that the silicon nitride layer is not exposed to an ambient atmosphere, such a teaching does not disclose

the temperature at which the transfer takes place. In addition, it would not be obvious to one skilled in the art to apply such a transfer process between a growth of an oxide layer and a subsequent deposition of a nitride layer, since the transfer process is specifically used to prevent exposure of a deposited silicon nitride layer. The Office Action references claims 5 and 9 in Halliyal as disclosing the claimed transfer process, but such claims merely discuss specifications of a nitridation process of second silicon oxide layer 32. In particular, claim 5 specifies the nitridation process includes flowing a nitrogen-containing gas into a rapid thermal CVD process apparatus. In addition, claim 9 specifies the nitrogen-containing gas may include ammonia, nitrogen oxide or nitrous oxide. There is no teaching or suggestion within either of such claims of transferring the topography prior to the nitridation process at a temperature similar to a temperature at which an oxide layer was previously deposited. Consequently, Halliyal does not teach or suggest the transfer process specified in claim 19.

In contrast to Halliyal, Buchanan appears to teach depositing an oxide layer and subsequently transferring the resulting semiconductor topography to a different chamber at temperatures within similar ranges. In particular, Buchanan teaches depositing an oxide layer upon a semiconductor topography at a temperature above 300° C (see column 4, lines 4-8) and maintaining the temperature of the semiconductor topography above 300° C during a transfer process to a different chamber (see column 4, lines 57-67). Buchanan, however, fails to teach or suggest growing the oxide layer by rinsing the semiconductor topography with an ozonated substance as specified by claim 19. To overcome such a lack of teaching within Buchanan as well as within Raaijmakers and Halliyal, the Examiner cites Foglietti teaching growth of an oxide layer by such a process and states it would be obvious to one skilled in the art to combine Foglietti with Raaijmakers, Halliyal, and Buchanan to use the method specified in claim 19. Such speculation, however, is traversed as set forth in more detail below.

Although Foglietti fails to disclose the temperature at which the oxide growth process presented therein is conducted, it is presumably performed at a temperature below the boiling point of the water (i.e., less than ~100° C) since Foglietti specifically teaches rinsing a topography in ozonated deionized water to grow an oxide layer. In contrast, however, Buchanan specifically teaches keeping a wafer at elevated temperatures of 250° C and above during the various processing steps of the method presented therein. "By maintaining the temperature of the wafer at about 250° C or above, a large improvement in electrical characteristics, particularly the mobility, is observed." (Buchanan, column 2, lines 28-31). Since the oxide growth process

described in Foglietti is presumably conducted at a temperature less than approximately 100° C, Foglietti cannot be combined with Buchanan to create the method described in claim 19. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). Furthermore, since neither Raaijmakers nor Halliyal teach or suggest transferring a topography at a temperature similar to a temperature at which an oxide layer was previously deposited (as noted above), no combination of Foglietti with Raaijmakers and/or Halliyal teaches the limitations of claim 19. Consequently, no combination of the cited art can teach the limitations of claim 19.

For at least the reasons stated above, none of the cited art, taken alone or in combination, teaches or suggests the limitations of claim 19. Therefore, claim 19 and claims dependent therefrom are asserted to be patentably distinct over the cited art. Accordingly, removal of this rejection respectfully requested.

#### CONCLUSION

This response constitutes a complete response to the issues raised in the Office Action mailed December 1, 2005. In view of the remarks traversing the rejections, Applicant asserts that pending claims 6-12, 15, 17-21, 23-27, and 30-35 are in condition for allowance. If the Examiner has any questions, comments, or suggestions, the undersigned attorney earnestly requests a telephone conference.

No fees are required for filing this amendment; however, the Commissioner is authorized to charge any additional fees, which may be required, or credit any overpayment, to Daffer McDaniel LLP Deposit Account No. 50-3268/5298-08000.

Respectfully submitted,



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